

CASE STUDY IN ESA PLANNING

This exercise demonstrate the essentials of ESA planning, assessment and identification of options for ESA coverage. It is a hypothetical case study but draws upon real data available for selected watersheds and subbasins. We have tried to make the case study representative of the broad range of geographic, physical, climatic conditions and land use/demographic features of the Pacific Northwest and which would be within the jurisdiction of county and other local governments. Even if the case study does not resemble your particular situation, it can still be useful for its illustration of a process for understanding and assessing the implications of ESA listings on your jurisdiction or activities.

The purposes of this exercise are multiple. First, this case study provides tools for conceptualizing a jurisdiction's role, ESA concerns and activities in a watershed or subbasin context. Second, the case study demonstrates tools that can be used to evaluate the impacts of governmental activities on listed salmonids and begin assessing possible ESA liabilities resulting from those activities. These tools and guidelines can be used to "practice" quickly assessing programs and activities with respect to ESA. Finally, the case study looks at various ESA pathways--or combination of pathways--for attaining certainty of compliance under the ESA. The case study poses questions and asks you to come up with a solution, given a number of factors, land uses, and circumstances. The assessment tools included in this package can be used to assess your own particular jurisdictions's ESA issues.

This case study focuses primarily on Section 4(d) and the limits available to local jurisdictions for ESA compliance. As such, the tools, procedures and processes used to develop a program that would qualify for a 4(d) limit are emphasized. Other tools for obtaining ESA compliance include Section 7 (federal) and Section 10 (habitat conservation plan) are addressed to some extent in this case study and are available to craft your own strategies to fit your particular circumstances.

Description of the Case Study

Chinook County

Chinook County lies within the Plateau Province and geographically encompasses the entire Chinook river watershed an area 781 square miles. The Chinook River and its several major tributaries originate in the surrounding mountains and drain ultimately to the Sandstone River and supply agricultural, municipal and domestic uses. The Plateau is an area characterized by even topography and thin soils bounded by steeply rising mountains and lies in the rainshadow of the Sandstone Mountains and the climate is semi-arid with cold winters and warm, dry summers. The county seat is located in the moderately-sized city of Rock Point, which is a regional center serving a series of smaller towns. Steelhead and chinook are listed as threatened under the ESA in the region (Map 1)

The three major tributaries to the Chinook River dissect the basin unevenly, and include Lime, Blue, and Bear rivers. These rivers and streams provide excellent substrate for spawning of summer/fall chinook salmon and both summer and winter steelhead. The mainstem and tributaries of the Chinook basin are some of the most highly productive native-type habitats in the Plateau province.

Predominant natural vegetation is shrub-steppe. Coniferous forests characterize the upper elevations and cottonwood communities dominate natural riparian areas. The province contains a number of terrestrial species uniquely associated with the shrub-steppe habitat types. The region is characterized by patches of high quality habitat mixed with areas which have considerable biomass potential with additional restoration work. These areas vary among and within individual watersheds.

Habitat Areas and Quality

Although the mainstem Chinook River flows year round to support salmonids, the three major tributaries are characterized as having low to moderate streamflow. Higher gradient portions of these streams contain sufficient flow volumes while some lower reaches of each tributary completely dewater during the summer months. Springs which used to sustain base flow in the summer have ceased to flow except during extremely wet years. Hydrologic and water quality data for the subbasin are shown in Table 1.

Habitat areas in the Chinook River subbasin are characterized by urban and orchard lands in the lower subbasin, shrub steppe lands along the valleys, dryland grain fields on the uplands, and shrub steppe and adjacent riparian forest, wetlands, mixed conifers and deciduous forest, and agricultural habitats. Wetlands occur as occasional features of the upper subbasin tributaries and provide important habitat for terrestrial wildlife and plant biodiversity. Approximately 80% of the mid to lower reaches of the Chinook River and its tributaries are classified as having highly erodible land.

All the streams in the basin have been designated as water quality limited for the purposes of the Clean Water Act either by temperature, turbidity or sediment.

Watershed Assessment

A subbasin and watershed assessment was recently completed for the Chinook Basin for the purpose of identifying the status of fish and wildlife resources, the factors for their decline, the key factors affecting habitat quality and quantity (Table 2). On a more refined level, watershed assessments of two of the

tributaries to the Chinook River have identified specific factors influencing habitat quality and quantity.

The key factors for decline of fish populations in the Chinook subbasin include water withdrawals, the reduction in stream channel complexity through straightening, channelization and removal of large woody debris, reduction of off-channel habitat, sedimentation of stream courses, passage blockage, and removal of riparian vegetation (Table 3). These factors operate to varying degrees within each watershed, as shown in Table 4.

Pursuant to the subbasin and watershed assessment local restoration strategies have been developed and prioritized. Table 5 shows the scope of the proposed strategy, locations are shown in the map.

The Planning Exercise

As a result of the recent listing of salmon and steelhead as threatened in the region, the publication of protective regulations for the species as the 4(d) rule, and the completion of the subbasin assessment, the county and city governments, other jurisdictions, and individuals have become aware that some of the activities they engage in may result in “take” of a listed species or harm its habitat. Nearly every jurisdiction is concerned about ESA compliance for these activities and reducing the risk of litigation. Table 6 shows the various entities effecting land and water management in the Chinook Basin.

In addition to the overall problem of ESA compliance, the county and cities in the basin are facing increasing demand for housing, infrastructure to manage increased population growth. Land use and development patterns in Chinook County and the incorporated towns of Sandy, Rock Point, and Windy Gap are changing rapidly. An intergovernmental task force has been convened and asked to address the following issues:

1. Evaluate the scope of current jurisdictional activities, policies and programs and identify whether any of the activities conducted or permitted may impact salmon or habitat conditions. If activities are found to impact salmon, identify any needed policy or technical guidance.
2. Develop the following projects and identify the appropriate ESA vehicle to assure that these activities are conducted in compliance with the ESA:
 - A. Provide for municipal, residential, commercial and industrial development and redevelopment in Chinook County
 - B. Develop (a) an irrigation screening or (b) habitat restoration program for the Chinook Basin
 - C. Develop an ESA strategy and approach for a selected problem of your choice.

While the task force is completing projects A, B and C, the county and city governments have asked that the task force also obtain information on the following questions: (1) What are the ESA risks and liabilities as the county/city constructs these projects? (2) What ESA option, or combination of options should the city/county pursue in completing these projects? (3) How would the city/county develop a package for submittal under the 4(d) rule limits? (4) How will NMFS evaluate the submission of the program?

SUMMARY FACT PATTERN¹

Location:	Chinook Subbasin : 500,000 acres 783 square miles (mi ²) An area climatically similar to landscapes in the Pacific Northwest Climate is semi-arid with warm, dry summers and harsh winters
Jurisdiction:	1 County covers the entire subbasin 1 medium size city (population 50,000) 2 small towns (population ~10,000 each) State and federal presence (BLM, COE, USFS)
Land Use:	50% Agricultural/Rural 30% Forest 20% Municipal, Residential, Commercial, Industrial Recreational, hunting, and fishing
Physical/ Biological:	1 major river and 3 important tributaries streams; 1 aquifer Several tributary reaches have been straightened/channelized Active erosion and deposition of stream channels(down cutting and banks) Range of water quality conditions Known spawning and rearing habitat for chinook and steelhead Isolated patches of high quality riparian forest vegetation
Basin Management:	County and city planning, engineering and water agencies State and federal land management and fisheries agencies Soil and water conservation districts Other local organizations, including and watershed councils ²
Subbasin Assessment for Fish & Wildlife Purposes:	Status of listed species; factors for decline, strategies to address decline At watershed scale, identification and prioritized problems & strategies

Table 1. Land use in the Chinook Subbasin

¹See accompanying tables and maps.

²These organizations are included here because of their strong role in education, coordination, and general contribution to basin management.

Watershed	Total Area	Acreage/% Total Area in Use			
		Ag	MRCI	Forest	Range
Blue	250,000 acres	60%	5%	15%	20%
Lime	60,000 acres	10%	<1%	79%	10%
Bear	130,000 acres	40%	20%	30%	10%
Chinook Basin	500,000 acres	50%	20%	20%	10%

Table 2. Hydrologic and water quality data for streams and rivers in the Chinook River basin

Stream Name	Total Area/Miles of stream	Flow (cubic feet per second)			Stream Temperature (°F)			Channel Condition/Dynamics
		Ave	Min	Max	Ave	Min	Max	
Blue River	250,000 ac/35	250	10	400	68	59	77	few pools; no refugia; changes in peak flows
Lime Creek	60,000 ac/18	80	40	150	54	50	60	good pool frequency, channel substrate; no changes in flow conditions
Bear River	130,000 ac/ 27	100	<10	300	67	60	74	no pools, no LWD; significant change in flow conditions

Table 3. Limiting factors analysis for listed species in Chinook Basin

Species	Distribution	Limiting Factors Analysis
Spring Chinook	All tributaries and mainstem Chinook River.	water quality-temperature & sediment blocked access habitat complexity channel stability
Winter Steelhead	Blue, Lime and Bear creeks;	blocked access LWD-complexity riparian vegetation water quality-t, turbidity
Pacific Lamprey	Blue and Lime creeks, mainstem chinook river	riparian zone water quality-T turbidity
Bull Trout	All tributaries and mainstem	temperature LWD complexity

Table 4. Table showing results of subbasin assessment and evaluation of stream conditions. Column contents indicate the nature of the problem found in the watersheds. Blank column

indicates this problem is not a factor in this watershed.

Watershed	Function Status	Passage	Un Screened Diversions	Habitat Elements	Water Quality	Hydrology	Channel	Watershed
Blue	NPF	culverts, push-up dams. >10 miles habitat blocked	Several	Substrate-LWD riparian veg	Sediment Temperature Turbidity	Changes in peak flow; base flow changes		High road density
Bear	At Risk	culverts road crossings		substrate LWD riparian veg	Temperature Sediment	Low stream flow in summer	ditches flood plain	high road density
Chinook	At Risk		Several	LWD Complexity Riparian veg	Temperature	Change in timing, size of flows	channelized; connectivity to flood plain	concentrated urban development; road density
Lime	Properly Functioning	no impairments	All diversions screened	complex and connected	cold and clean	normal range of flows and peak flows preserved		low road density

Table 5. Watershed assessment, identification of restoration strategies; priorities by watershed

Watershed	Priority Areas (on map)	Fencing	LWD	Culverts	Riparian Planting	Instream Function	Screening
Blue	1, 4, 6	10 miles	Place	15 culverts	18 miles	pool increases	55 diversions
Bear	2, 3, 5	16 miles	Place	24 culverts	25 miles	off-channel habitat; refugia	30 diversions
Chinook	7, 8, 9		Place		30 miles	LWD; off channel habitat; refugia	45 diversions

Table 6. Subbasin management entities, Chinook Basin

Subbasin Management Agencies and Authorities Chinook County			
Agency	Activities	Authorities	Existing Salmon Protection Measures
Chinook County Planning Agency	Regulation of land uses on county lands; permits county development programs; conducts routine road maintenance on county roads; environmental planning for county lands	County ordinances and policies; state and federal rules and regulations	
City of Rock Point	Manages land uses within the city boundary; regulates municipal water supply; regulates and manages wastewater	City policies and ordinances; federal and state rules and regulations	Approved screened municipal intakes and discharge points
City of Sandy	Manages land uses within the city boundary; regulates municipal water supply	City policies and ordinances; federal and state rules and regulations	
County SWCD	Conducts conservation activities on agricultural lands	District ordinances, procedures; landowner participation; federal partnerships (primarily NRCS)	
State Department of Transportation	Road maintenance and emergency repairs to state-owned roads	State policies and federal regulations	
State Water Resources Department	Regulates water diversions, permits new surface and ground water diversions	State policies and law; applicable federal regulations	Mechanism for protecting instream rights as junior to all other users
State Environmental Quality Division	Permits discharges, regulates water quality	state policies, laws and federal regulations	
Agency	Activities	Authorities	Existing Salmon Protection Measures

Subbasin Management Agencies and Authorities Chinook County			
State Fish and Wildlife Agency	protect and enhance fish and wildlife; review and permit habitat restoration measures	Agency policies, state and federal legislation	Natural Production Policy; Wild Fish Management Policy; Guidelines for in-water work to protect FWL resources; Subbasin salmon and Steelhead Production Plan
Rock Point Flood Control District	Operates and maintains levees and channelized portions of streams	Contract with COE for operation, maintenance and repair	
State Forestry Agency	Permits harvest operations	State forestry regulations; Forest and Fish Report (4(d))	All activities conducted pursuant to the FFR guidelines are ESA-approved
Watershed Council	Conducts habitat restoration activities; public education events	Grant funds combined with willing landowners; state salmon recovery fund and program	
US Forest Service	Manages forested lands for timber, wildlife and watershed purposes	USFS policies and federal legislation Northwest Forest Plan	Aquatic Conservation Strategy
Bureau of Land Management	Manages land for grazing, timber	BLM policies and federal legislation NW Forest Plan	ACS on forested lands
Corps of Engineers	Permits dredge and fill operations; contract with FCD for O&M; conducts emergency repairs/ops	Flood Control Act, 404 Permit authority; Corps policies & other federal legislation	FWL coordination Act
NRCS/FSA	Assists in the development of and funds on farm management practices	NRCS Assistance programs including watersheds, CRP, EQIP, CREP	Guidelines under development